REBUTTAL TESTIMONY

OF

ANDREW R. WALKER
ON BEHALF OF

DOMINION ENERGY SOUTH CAROLINA, INC.

DOCKET NO. 2023-9-E

Q. PLEASE STATE YOUR NAME, BUSINESS ADDRESS AND POSITION WITH DOMINION ENERGY SOUTH CAROLINA, INC. ("DESC" OR "COMPANY").

A. My name is Andrew R. Walker and as of July 3, 2023, my business address is now 601 Old Taylor Road, Cayce, South Carolina 29033. I am employed by DESC as Strategic Advisor, Power Generation.

Q. ARE YOU THE SAME ANDREW R. WALKER WHO PREVIOUSLY TESTIFIED IN THIS DOCKET?

A. I am.

Q. HAVE YOU REVIEWED THE DIRECT TESTIMONY OF WITNESS ANTHONY SANDONATO, WITNESS LEAH WELLBORN, AND WITNESS PHILIP HAYET ON BEHALF OF THE OFFICE OF REGULATORY STAFF ("ORS") AND WITNESS DEREK STENCLIK AND WITNESS JIM GREVATT ON BEHALF OF THE COASTAL CONSERVATION LEAGUE AND SOUTHERN

ALLIANCE FOR CLEAN ENERGY ("CCL/SACE") AND SIERRA CLUB IN THIS PROCEEDING?

A. I have.

Q. WHAT IS THE PURPOSE OF YOUR REBUTTAL TESTIMONY?

A. The purpose of my rebuttal testimony is to respond to issues raised in the direct testimonies of ORS and CCL/SACE and Sierra Club regarding the retirement and replacement planning process for Wateree and Williams. Company Witness Scott Parker will respond in more detail to the issues related to the 2022 Transmission Impact Analysis. I will respond to other issues raised relating to the operation of the DESC generation system as it relates to the IRP, such as the steps DESC has taken to pursue coal plant retirements, the minimum up and down time assumptions for existing and new combined-cycle ("CC") and simple-cycle combustion turbine ("CT") resources, the reliability and accounting for outages during major weather events, the feasibility of replacing the dispatchable capacity represented by Williams with a combination of battery and solar resources, and the cost assumptions for continuing to operate Wateree and Williams.

Q. IS WITNESS STENCLIK ACCURATE IN HIS CLAIM THAT DESC HAS TAKEN NO MEANINGFUL STEPS TOWARDS REPLACING WATEREE AND WILLIAMS FOR OVER THREE YEARS AND

DESC'S OWN DELAYS ARE PREVENTING AN EARLIER RETIREMENT FOR WILLIAMS?

A. No. DESC began taking deliberate steps to study retirement and replacement options for Wateree and Williams by 2020. As Witness Best has indicated, the decision to plan for the early retirement of these plants has been driven by the Company's support of Dominion Energy Services, Inc.'s enterprise-wide goal of reaching Net Zero carbon and methane emissions by 2050 to the extent that doing so remains consistent with maintaining reliability and affordability for customers. This decision was also consistent with the enterprise-wide stated vision to become the most sustainable energy company in the industry. These commitments were announced in early February of 2020.

DESC filed the 2020 IRP on February 28, 2020, in Docket No. 2019-226-E and included in it Resource Plan 8 ("RP8") which evaluated the retirement of both Wateree and Williams in 2028. In its direct testimony in the 2020 IRP proceeding, and in its report on the 2020 IRP, ORS requested DESC to prepare and file a formal coal plant retirement study. In his rebuttal testimony in that proceeding, Company Witness Eric Bell communicated the Company's agreement to begin a detailed study of the early retirements of Wateree and Williams. In Order No. 2020-832, the Commission ordered DESC to complete a retirement study to "inform development of its 2022

IRP Update and its 2023 IRP and to solicit parties' recommendations on guidelines for performing this analysis through the ongoing IRP Stakeholder Process." (*See* Order No. 2020-832, p. 17). The Company then filed its Modified 2020 IRP, on March 21, 2021, and selected RP8 as the preferred plan.

DESC prepared a Coal Plants Retirement Study which it presented to the Commission in Docket No. 2021-192-E in May 2022. That study thoroughly evaluated the retirement date assumptions for both Wateree and Williams and laid out the planning process and timelines for potential early retirements to serve as a reasonable set of planning assumptions to inform the 2023 IRP while ensuring that continued reliable service is maintained. The Company determined at that time that it was not feasible as a planning assumption to assume that it could replace Williams by 2029, primarily due to the electric transmission infrastructure upgrades required, and that to ensure reliability for its customers, certain investments would need to be made at that facility to ensure compliance with the Environmental Protection Agency's ("EPA") Steam Electric Effluent Limitation Guidelines ("ELG") rule such that it could run past December 31, 2028.

In concert with the Coal Plants Retirement Study and in parallel with the development of the 2021 IRP Update, the 2022 IRP Update, and the 2023 IRP, the Company has conducted multiple Transmission Impact Analyses

("TIAs") that support its decision-making related to coal retirement and replacement. These TIAs are described in detail in the 2023 IRP (pages 27-29) and in the rebuttal testimony of Company Witness Scott Parker. These studies have indicated that the optimal location for the replacement of the generation currently represented by Williams Station is the site of the now-retired Canadys Station coal-fired generation units in Colleton and Dorchester Counties. The 2022 Coal Plants Retirement Study concluded that retirement of Wateree by 2029 may be possible and the 2023 IRP has presented multiple scenarios for replacing the Wateree capacity.

Finally, it should be noted that the Company has begun to pursue a potential future joint generation resource with Santee Cooper to increase economies of scale for all parties involved in such a project. The Company has recently begun the process to identify incremental natural gas supply to support the development of a potential future joint resource which would support the replacement of these units and a TIA to study this option is underway. The Company has not delayed the process of pursuing the retirements of Wateree or Williams in any way but is diligently pursuing the analysis needed to be certain that those retirements can be accomplished without jeopardizing reliability to customers.

Q. DO YOU AGREE WITH WITNESS STENCLIK THAT DESC COULD HAVE SAVED $90 MILLION OF RETROFITS BY PROVIDING

EARLIER NOTICE TO THE EPA OF THE INTENT TO RETIRE WILLIAMS UNDER THE ELG RULE?

A. No. If DESC were to have followed Witness Stenclik's suggestion, it would have put reliable service to its customers at risk and it would have foreclosed the opportunity for a least-cost approach to compliance for Williams Station under the currently-effective ELG rule. Had the Company placed Williams on the Voluntary Incentive Program ("VIP") compliance approach under the ELG rule, DESC would have been forced to either install more costly compliance technology or, alternatively, potentially retire Williams before the end of 2028, regardless of the availability of suitable replacement resources. A forced retirement of Williams by the end of 2028 without available, suitable replacement resources could jeopardize DESC's ability to serve its customers reliably, especially in the growing metropolitan Charleston area which is heavily dependent on the dispatchable Williams unit to support the electric transmission system in that region. As Witness Parker testifies, DESC's modeling, the TIAs, and the 2022 Coal Plants Retirement Study consistently show that the transmission system cannot be operated reliably without Williams or a suitable replacement and associated electric transmission upgrades. As a practical matter, even in the optimal cases studied through the TIAs, the transmission projects required to support replacing the dispatchable generation capacity represented by Williams cannot be completed before 2030 at the earliest.

Q. WHY IS REPLACING THE CAPACITY AND ENERGY REPRESENTED BY WILLIAMS SO IMPORTANT TO RELIABILITY IN THE CHARLESTON AREA?

A. From my perspective in generation operations, I can testify from direct knowledge that keeping Williams online during extended periods throughout the year is critically important to maintaining system reliability in the Charleston area. Permanently removing Williams from the DESC system without suitable replacement resources would put system reliability at risk. For normal operations, Williams is committed as a reliability must-run unit to support transmission system reliability in the Charleston area. The unit's planned outage evolutions must be carefully coordinated and scheduled between DESC's Power Generation and Electric Transmission groups as the availability of the unit for dispatch is critical for the Company's Power Delivery group (electric transmission field operations) to be able to conduct routine maintenance on existing electric transmission infrastructure in the Charleston area and greater Lowcountry of South Carolina. When it is necessary to schedule plant maintenance outages that arise between planned outage evolutions, these outages must be closely coordinated between

DESC's Power Generation and Electric Transmission's Operations Planning groups.

Q. WITNESS STENCLIK ASSERTS THAT STORAGE RESOURCES CAN REPLACE 100% OF WILLIAMS CAPACITY AND AVOID TRANSMISSION AND PIPELINE PERMITTING AND CONSTRUCTION TIMELINES. IS THIS CORRECT?

A. No. Witness Stenclik provides no engineering or transmission modeling to back his assertion that storage and solar resources can replace 100% of Williams capacity without extensive transmission upgrades. (S*ee* Stenclik Direct, p. 33). I agree with the rebuttal testimony of Witnesses Best and Parker that Witness Stenclik's assertion is not sustainable from several perspectives. From a generation operations perspective, energy storage can certainly be a useful asset (as the Company has long demonstrated through the operation of its Fairfield Pumped Storage facility), but battery storage is inherently energy-limited with currently cost-effective, commercially-deployed battery energy storage resources generally only incorporating up to four (4) hours of energy duration.

There are two major issues with Witness Stenclik's assertion that DESC can avoid significant electric transmission upgrades by replacing Williams with battery energy storage. The first is that after batteries are discharged/used, they must be recharged. In doing so, they become a load that other generation and transmission assets must serve to recharge. The existing electric transmission infrastructure at the Williams Station site has long been designed to support a generating resource that is providing energy across all hours of the day (during both peak and system minimum periods). The installation of battery resources at the site would essentially create a massive new load on the transmission system during charging operations. Unlike the Company's existing large energy storage asset at Fairfield Pumped Storage, which is co-located with the baseloaded V.C. Summer nuclear unit and adjacent generating resources at Parr, there are no similar baseloaded generating resources adjacent to Williams Station to charge storage at the site.

The second challenge to using battery energy storage sited at Williams to replace the capacity represented by the existing unit goes back to my original description of the current operation of the Williams unit as essentially a reliability must-run resource today. Because batteries do not generate continuously and must be charged, they simply cannot provide continuous, around-the-clock energy delivery and cannot operate as an around-the-clock must-run resource.

These challenges of retiring and replacing Williams are largely driven by the fact that there are simply a very limited number of existing generation resources in the DESC Balancing Area near Charleston. From my experience and operational perspective, I do not see how DESC could continue to provide reliable service to the Charleston metropolitan area if DESC were to retire Williams Station and replace it only with energy-limited batteries that will be offline or have to be recharged (creating a significant new load) through the same transmission system that today is frequently challenged to serve the area when Williams Station is offline.

Q. WHAT ABOUT USING SOLAR TO RECHARGE THESE HYPOTHETICAL BATTERIES?

A. Presently, there are no large utility-scale solar generating facilities on DESC's system within approximately 60 miles of Charleston. This lack of large-scale solar facilities in the area is presumably due to limitations imposed by current land use patterns, environmentally sensitive coastal marshlands and wetlands, and higher land costs that challenge large-scale solar development in that area. As a rule of thumb, with buffers, access roads, and ancillary facilities, existing solar generating facilities on the Company's system require approximately 5-10 acres per MW-AC of installed nameplate generation. At a 25% capacity factor which Witness Stenclik suggests, it would take tens of thousands of acres of new solar farms to produce the energy to charge the battery energy storage resources that Witness Stenclik proposes. Bear in mind that this solar capacity factor is an annual average and it does not take into account the problem of how to recharge these hypothetical batteries during periods of extended cloud cover, such as during a multi-day winter storm. To mitigate the electric transmission upgrades that have been identified for a Williams replacement, these hypothetical solar farms would have to be located in or near the area surrounding Williams Station (*i.e.,* the Bushy Park peninsula) or otherwise within the rapidly expanding Charleston metropolitan area where developable land is at a premium. New solar generation located in this area to charge batteries at the scale required to replace Williams is just not practical.

For these reasons, I concur with Witnesses Best and Neely that the most reasonable and prudent planning decision for DESC is to assume that the Company retires Williams as early as feasible and practical, which was identified as the end of 2030 per the 2022 Coal Plants Retirement Study, and to invest in ELG compliance upgrades to ensure that DESC is able to operate Williams Station until suitable replacement resources (and associated infrastructure, including electric transmission) are available.

Q. THROUGH WITNESS HAYET'S TESTIMONY, ORS REQUESTS THAT THE COMPANY PROVIDE ADDITIONAL INFORMATION ABOUT HOW THE CAPITAL AND O&M COST INPUT ASSUMPTIONS WERE DERIVED ASSOCIATED WITH THE WATEREE AND WILLIAMS UNITS FOR THE TIME PERIOD BEYOND 2030. CAN YOU RESPOND?

A. Yes. The capital and O&M costs used to model the continued operation of Williams for the period 2030 to 2047, which is the assumed end of Williams' useful life, were prepared by DESC's Resource Planning group and are based on a long history of the Company's maintaining this unit and units of similar vintage and includes both on-going/planned and emergent/unplanned maintenance requirements. These cost estimates were escalated by Company Witness Neely using generally applicable escalation factors.

DESC has deep knowledge of what is involved in maintaining older steam units. In recent years, the units in question have been receiving on-going investment in upgrading systems including arc-flash resistance electrical switchgear to protect the safety of employees, digital control system upgrades (including cybersecurity-required upgrades), winterization, and the on-going maintenance of supercritical boilers and high pressure/high energy piping. Such prudent investments are necessary until such time as definitive replacement generation has been identified and the Company has a certain retirement date for these units. These capital investments are in addition to equipment that is subject to normal teardown, inspection, and maintenance as required on regular intervals. As a result, the inputs in question are based on well-understood maintenance histories and reflect a reasonable estimate of the expenditures required to keep Williams operating efficiently and reliably until the end of its useful life, which is currently estimated to be 2047.

Based on my generation operating experience, these cost data are reasonable inputs to use in the planning process. As discussed previously in my testimony, one of the drivers for the Company evaluating a thoughtful retirement of its remaining coal-only generators is to minimize the potential exposure to future costs; the costs to continue to operate and maintain Williams may increase as the unit continues to age and continually more stringent regulatory requirements are imposed (environmental, safety, and cybersecurity/reliability compliance). However, as a planning assumption, the assumptions embedded in the modeling of Witness Neely are based on known maintenance histories and practices.

But this is an issue that may be worthy of additional study and DESC is happy to continue to discuss these cost inputs in the context of the on-going stakeholder process for the IRP. However, the Company believes that its current forecasts for the cost of maintaining these units are reasonable planning assumptions.

Q. DID WITNESS HAYET'S QUESTION ABOUT FUTURE CAPITAL AND O&M COSTS EXTEND TO WATEREE AS WELL AS WILLIAMS?

A. It did, but I am not aware of any analysis in this IRP that assumes that Wateree would remain in operation beyond 2029. But if there were such costs to be modeled, the input data would be derived in the same way and my opinion about the data would be the same.

Q. ORS WITNESS HAYET NOTED "SIGNIFICANT CAPITAL COST INCREASES . . . ASSOCIATED WITH THE GENERIC CT [COMBUSTION TURBINE] RESOURCES, COMPARED TO WHAT THE COMPANY ASSUMED IN THE 2022 IRP UPDATE." (P. 9) CAN YOU EXPLAIN?

A. Yes. This issue relates to candidate resources that the Company includes in its modeling for the PLEXOS resource optimization software to select from when building optimized resource portfolios. Specifically, I believe Witness Hayet's concern is about changes between the 2022 IRP Update and the 2023 IRP Frame and Aeroderivative ("Aero") CT candidate resources that were modeled. It should be noted that the inputs for these candidate resources are provided by the Dominion Energy Services, Inc. ("DES") Project Construction group; this data set is frequently referred to internally as the "green sheets".

With respect to the modeled Aero CT resources, the 2022 IRP Update included a "1X Aero" candidate resource that was based on the General Electric LMS100 turbine technology. For the 2023 IRP, there were two Aero

CT candidate resources modeled: a "1X Aero" and a "2X Aero". For the 2023 IRP, these two candidate resources were based on a single or set of two, respectively, General Electric LM6000 units (similar to what are presently being constructed at the Bushy Park and Parr sites). The Company's update of the underlying technology in its candidate resources is informed by its commercial experience with the CT market; the LM6000 technology was recently bid to the Company by General Electric in preparing its responses to the Urquhart Replacements All Sources RFP ("Urquhart RFP").

With respect to the Frame CT candidate resources, the underlying assumed combustion turbine technology has not changed between the 2022 IRP Update and the 2023 IRP; these candidate resources have been based on the Siemens SGT6-5000F F-class frame CT technology. The increase in cost assumptions for these resources between the 2022 IRP Update and the 2023 IRP are largely attributable to recent inflationary pressures (commodities, materials, and labor) and the costs for associated Engineering, Procurement, and Construction ("EPC") services to construct these units. Again, the Company's experience with recent projects informed these EPC cost estimate updates.

The "green sheet" data that the Project Construction organization provides to DESC for its IRP modeling are informed by actual market data and the Company's experience in the marketplace. The updates in the underlying technology basis for the Aero units and the EPC cost assumptions for the Frame CT candidate resources reflect these costs being based on actual market data and trends. The cost assumptions for these Aero and Frame CT units, like other inputs, will continue to be updated in future IRPs and IRP updates.

Q. IN CONSTRUCTION OF HIS ALTERNATIVE PORTFOLIOS, WITNESS STENCLIK HAS UNILATERALY CHANGED THE MODELING ASSUMPTIONS RELATED TO THE MINIMUM UP AND DOWN TIMES FOR DESC'S CC AND CT RESOURCES. ARE HIS ASSUMPTIONS REASONABLE?

A. No. Witness Stenclik's assumptions concerning revised assumed minimum up and down times for natural gas units, which he admits were chosen to improve the dispatch and thus lower the costs of solar, are not reasonable.

Q. PLEASE EXPLAIN.

A. DESC has established prudent operating constraints for its CC and CT resources that are in-line with industry standards for preventing excessive wear and tear, preserving reliability, minimizing maintenance costs, and conserving the value of these valuable assets over their useful lives. Witness Stenclik has assumed overly aggressive minimum up and down times for these units that are a fraction of the actual operating constraints DESC prudently imposes on its existing units. Witness Stenclik's minimum up and down times may be appropriate for emergency situations but are not reasonable assumptions for day-to-day dispatch of these units over the many years of service that they are expected to provide to DESC's customers. A reasonable analogy would be redlining the engine in an automobile every time it accelerates. Redlining can be done occasionally or in emergencies if one absolutely must, but it is not a prudent way to operate your automobile on an on-going basis.

The minimum up and down times reflected in Company Witness Neely's PLEXOS model reflect how DESC in fact operates these resources and his assumptions as to maintenance costs, forced outage rates, scheduled outages and useful lives are also based on these operating constraints. It is inappropriate to change the operating assumptions while ignoring their impact on costs, as Witness Stenclik has done.

Q. WHY ARE THESE MINIMUM UP AND DOWN TIMES CONSTRAINTS IMPORTANT FROM AN OPERATING STANDPOINT?

A. Natural gas fired generating units are complex machines consisting of many hundred tons of metal, much of which rotates at extremely high speeds and with exceptionally tight mechanical tolerances. These machines combust fuel at high temperatures (frequently exceeding 2000°F in normal operation);

the components within these machines are designed to absorb the stresses of heating up and cooling down between these operating conditions from ambient conditions by following carefully prescribed warmup and cooldown schedules. Minimum up and down times allow this to happen. Cutting these times short can stop this warmup or cooldown process in mid-course, increasing thermal stresses and can result in additional wear and tear, outages, and maintenance expense. Sustained aggressive operation can ultimately shorten the useful lives of the units.

Q. WHAT SUPPORT DOES WITNESS STENCLIK PROVIDE FOR HIS REVISED MINIMUM UP AND DOWN TIMES?

A. Witness Stenclik provides no support for the reasonableness of his assumed minimum up and down times as standard utility dispatch criteria and they are both inconsistent with DESC's actual operating criteria, and with the prudent operation of the units to preserve their value and minimize their costs. DESC's minimum up and down times are based on sound engineering and prudent operating practices.

Q. DO YOU AGREE WITH WITNESS STENCLIK'S ASSERTION THAT THE TESTIMONY OF MR. HENRY E. DELK, JR. IN DOCKET NO. 2023-2-E REGARDING WEATHER OUTAGES IS "HIGHLY MISLEADING?"

A. No. Due to unforeseen circumstances in advance of this year's annual fuel proceeding, I adopted the pre-filed direct testimony of Mr. Delk as my own and represented the Company's Power Generation group during the hearing. The description in what I adopted as my testimony was entirely accurate concerning the significant outages that occurred on December 24, 2022. I stand by that testimony.

Q. PLEASE ELABORATE.

A. As I testified in Docket No. 2023-2-E, on December 24, 2022, Urquhart Station Unit 6 tripped offline due to a failure that was "mechanical in nature" and "not due to cold ambient temperatures." This is true. The unit tripped offline due to a purely mechanical issue internal to the combustion turbine's liquid fuel firing system that could have occurred regardless of ambient temperatures. Urquhart Station does not have 100% firm transportation of natural gas supply and relies upon liquid fuel (in the form of ultra-low sulfur fuel/heating oil stored on site) whenever all units at the facility are operating and interruptible transportation natural gas is not available from interstate pipelines. On December 24, 2022, this unit was running as designed on fuel oil when the mechanical issue internal to the unit caused it to trip offline. There was no weather-related failure by the upstream interstate natural gas pipeline supplying Urquhart Station nor the DESC local distribution company that serves the site to deliver gas supplies that the plant was entitled to receive.

Q. HOW DO YOU RESPOND TO WITNESS STENCLIK'S LIST OF WHAT HE ASSERTS ARE SIGNIFICANT WEATHER-RELATED OUTAGES IN THE WINTER STORM OF DECEMBER 24-25, 2022.

A. This list is potentially misleading for a number of reasons. Most importantly, it is misleading because it seeks to use anecdotal evidence to prove a correlation between extreme cold and outages. This is something DESC monitors and to date has not observed such a statistical correlation.

In addition, the list from Witness Stenclik's testimony covers two full days (December 24 and 25, 2022), while the impacts of the extreme cold weather event occurred during a much more limited window on the morning of the 24^{th}. The list does not distinguish between outages that lasted in some cases for only minutes (Hagood CT #4 on December 25) and outages that did not materially affect system reliability (specifically, the forced outage on Jasper CT #1 and the accompanying forced derate this imposed on the associated bottoming-cycle Jasper #4 steam turbine unit) vs. those that are accurately discussed in my adopted fuel proceeding testimony that had a material impact on meeting generation needs. Witness Stenclik's list also includes outages that as discussed in my adopted fuel proceeding testimony that have nothing to do with weather, such as the aforementioned outage on

Urquhart Unit 6 (and associated bottoming-cycle steam turbine Unit 2) and an outage due to a boiler tube leak on Wateree Unit 1 that could occur at any time regardless of ambient temperature conditions. One of the outages that he lists occurred at an older peaking unit (specifically, Parr CT #3) that has since been retired and the Company is actively replacing under its peaking modernization plan as discussed in Docket No. 2021-93-E.

Q. WITNESS STENCLIK STATES "THAT THE RISK OF CORRELATED, WEATHER DEPENDENT OUTAGES, IS ONE OF THE MOST SIGNFICIANT, UNACCOUNTED FOR RISKS IN DESC'S SYSTEM, AND WILL ONLY BE AMPLIFIED WITH AN ADDITION OF A LARGE SHARED COMBINED CYCLE RESOURCE." DO YOU AGREE?

A. I agree that correlated, weather dependent outages are a risk to DESC's system, as they are to any electric system. However, Witness Stenclik's assertion that adding a large shared CC unit to DESC's system will increase risk is exactly backwards. Adding a modern, fully winterized, dual-fuel CC unit will reduce risk to the system generally by supporting the replacement of aged facilities and in ways that energy-limited storage and intermittent renewable resources (like solar) cannot.

Q. PLEASE EXPLAIN.

A. Modern CC units operate reliably across the world and in far more extreme climates than South Carolina. The design features and technology for winterizing these units against harsh conditions are well tested and well understood. Given what the North American utility industry has learned in recent years about the risk of extreme winter weather to electric systems, specifically from Winter Storm Elliott (2022), Winter Storm Uri (Texas 2021), and the Polar Vortex (2014), DESC has already adopted extremely stringent winterization requirements and design bases for any new self-built generation resources. The winterization design requirements for the replacement aeroderivative simple-cycle CT units that it is actively constructing at the Bushy Park and Parr facilities exceed what the Company was able to retrofit its existing facilities to following the 2014 Polar Vortex. The same is anticipated to be true for any new joint CC resource constructed. To the extent it is ultimately constructed, such a CC unit will be designed to function reliably in conditions as extreme or more extreme than any that have been historically encountered in our service territory in recent decades.

Q. WHAT ABOUT FUEL SUPPLY RISKS?

A. Witness Stenclik's assertions around the reliability of CC and CT resources during peak winter events is a common issue being discussed in multiple jurisdictions (including vertically integrated utilities like DESC and larger RTO/ISOs like PJM). An important nuance of these arguments around the "firmness" of CC and CT resources and their ability to provide capacity to meet critical winter peaks is the presence of dual-fuel (natural gas and liquid fuel) capabilities and the degree to which a facility has firm or interruptible natural gas transportation. There are many third-party CC or CT resources in other jurisdictions (like PJM) that are only capable of natural gas-only operation or that do not subscribe to firm transportation for natural gas supply and fully rely upon interruptible transportation (without dual-fuel capability and on-site fuel storage); it is no surprise that such resources have exhibited decreased reliability during peak winter events. But it is wholly improper to cast aspersions on the reliability of new CC or CT resources on DESC's system by trying to draw comparisons to resources on other systems without taking both winterization and fuel-supply capabilities into account.

DESC intends to obtain 100% firm natural gas transportation service for any new CC facilities it constructs to serve as its primary fuel source. To the extent that it is able to permit and incorporate in plant design, the Company anticipates also designing such facilities to be able to utilize liquid fuel (stored on-site) as a standby/backup fuel. This approach to having dual-fuel capabilities is in-line with the capabilities of all of the existing or under-construction CC and CT resources on the DESC system today (although these units do not presently also have the benefit of being fully fueled with

100% natural gas firm transportation as is contemplated with any new CC facilities).

Thus, any new CC resource (including the potential shared/joint project being explored with Santee Cooper) should have two independent sources of firm fuel supply and will only need to rely on fuel oil if ***firm transportation*** natural gas service is curtailed (which is a rare occurrence). Given its anticipated level of weatherization and fuel supply strategy, any new CC unit being used to replace existing resources should ultimately improve the ability of DESC's system to support reliable service during extreme weather events and not degrade it as Witness Stenclik suggests. In fact, a new CC, if ultimately built will contribute to system reliability in ways that adding solar and battery resources to DESC system cannot.

Q. WHY IS THAT?

A. Batteries are still a novel resource at utility-scale but are well known to be subject to charge and discharge limitations, particularly when cold or overheated. Utility-scale battery resources have simply not been subject to real world testing to the same degree that CC and CT units have, which have been in operation in extreme climates throughout the world for decades. The requirements for winterizing battery resources and their related inverters and support facilities are not yet fully known. As Witness Wintermantel testifies, the initial reports concerning forced outage rates from large utility-scale battery storage resources in California are concerning.

Solar is preeminently the generating resource that is affected by extreme weather since the output of solar is dependent at all times on the amount of solar irradiance available and this irradiance is influenced by the presence of cloud cover or haze. Winter storms bring cloud cover that can last for days making solar effectively unavailable and hot weather can bring hazy weather that also limits solar generation. Neither solar nor the battery storage technologies that are currently available can provide the non-intermittent, dispatchable, long-duration energy that a modern advanced-class CC unit with two, diverse firm sources of fuel supply can dependably provide.

Q. IS IT THE CASE THAT DESC IS NOT "ACCOUNTING" FOR THE CORRELATION OF WEATHER RISKS IN OPERATING ITS SYSTEM?

A. No. DESC is accounting for correlated, weather dependent outage risk by taking steps to eliminate or minimize such risks from an operating perspective. DESC is continuing the weatherization of existing units that began after the Polar Vortex of 2014. Following Winter Storm Elliott in December 2022, the Company identified deficiencies in the legacy weatherization of the Columbia Energy Center units, which it acquired subsequent to its 2014 winterization upgrades of its existing units. I am pleased to report that the wholesale replacing of the heat tracing systems on the units at Columbia Energy Center facility is progressing well and the generating units at this facility (Units 1, 2, and 3) are on track to have had their heat tracing equipment completely replaced by the upcoming Winter 2023-2024 season through work conducted during the plant's Spring 2023 planned outage, online work this summer, and during work planned for the facility's Fall 2023 planned outage. Additionally, the Company continues to implement and improve the seasonal extreme weather plans it implemented in 2014. For more information on these plans, please see the *Comments of Dominion Energy South Carolina, Inc. Regarding Certain Threats to Safe and Reliable Utility Service* filed in Docket No. 2021-66-A. The risk of weather-related outages is fully accounted for in how DESC plans and operates its utility system.

Q. ORS REQUESTS THAT DESC DISCUSS THE PROPOSED REGULATIONS RECENTLY ANNOUNCED UNDER THE CLEAN AIR ACT ("CAA') SECTION 111 CONCERNING GREENHOUSE GAS ("GHG") EMISSIONS FROM FOSSIL FUEL-FIRED ELECTRIC GENERATING UNITS. WHAT IS DESC'S RESPONSE?

A. On May 11, 2023 (several months after DESC filed its 2023 IRP) the EPA announced a proposed rule under Section 111 of the CAA for the regulation of GHG Emissions from Fossil Fuel-Fired Electric Generating Units. This ***proposed rule*** is in the early stages of public comment and remains subject to being materially changed, withdrawn, or fundamentally redrafted before it is issued as a final rule in the Federal Register. It is worth noting that this proposed rulemaking activity follows the action of the United States Supreme Court in *West Virginia vs. EPA (20-1530)*; if history is a guide, any final rule from EPA will likely be litigated. DESC will continue to closely monitor the development of this rule and appropriately evaluate its impact on generation planning in future IRP updates. DESC is working through multiple channels on providing comments to EPA on this proposed rulemaking including direct comments from Dominion Energy, Inc. and is supporting the development of comments from the Electric Power Research Institute ("EPRI") on behalf of member utilities, and through a collaborative process spearheaded by ORS and the South Carolina Department of Health and Environmental Control ("DHEC").

EPA identifies two primary compliance pathways for high capacity factor CC generation under the proposed rule. These two pathways to compliance include the requirement to incorporate carbon capture and sequestration or the utilization of green hydrogen (to various degrees) beginning in the 2030s. As drafted, it appears that EPA has assumed a compliance path for South Carolina that is based on heavily relying upon the utilization of "green" hydrogen (produced through non- or extremely low GHG-intensity energy) presumably because the geological conditions of South Carolina are generally not conducive to carbon sequestration. At present, neither carbon capture and storage nor green hydrogen supply are commercially-available at scale which raises a significant issue as to whether these technologies meet the legal standard of Best System of Emission Reductions ("BSER") that the CAA requires EPA compliance standards to reflect.

That said, DESC has existing and under-construction CC and CT resources that should be forward-compatible with utilizing hydrogen assuming hydrogen ultimately becomes commercially-available and cost-effective. DESC would plan to evaluate the future capabilities of any new CT or CC resources to also be forward-compatible with the future utilization of hydrogen as well.

DESC is concerned with potential unintended consequences of the proposed rule that could create perverse incentives to retain some older, less efficient generating resources (both in terms of cost-efficiency and GHG emissions intensity) in lieu of constructing more efficient, reliable, and flexible resources. Additionally, these unintended consequences appear to extend to the potential changes in unit dispatch to which the proposed rule could lead. If green hydrogen or carbon capture and sequestration do not become commercially-viable and cost-effective, the rule could lead to the Company being forced to take annual capacity factor operating limitations on its most efficient combined-cycle units while leaving less efficient generators (like gas-fired steam units and CT units) unaffected. Such an environmentally constrained dispatch may not only no longer be least-cost/economic but could also, on net, actually *increase* total emission of GHGs. These unintended consequences appear contrary to EPA's larger goals with the rulemaking and likely reflect the complexity of EPA's regulatory constraints following *West Virginia*.

Nevertheless, as the proposed rule continues to progress through the comment and review period, DESC will review the potential impacts and if warranted, the proposed rule or a final rule may be the basis for a sensitivity analysis in future IRPs and IRP Updates.

Q. DOES THIS CONCLUDE YOUR REBUTTAL TESTIMONY?

A. Yes, it does.